PATENT APPLICATION
042390.P11448

Remarks

Reconsideration of this application is requested. By this amendment, claims 1-4, 7-10, 15, 16, 18, 23, 30, and 33-36 have been amended and claims 37-41 have been added. Accordingly, claims 1-41 are in the application.

Disqualification of Berstis using an Affidavit under 37 C.F.R. § 1.131

This response is filed concurrently with an affidavit filed under 37 C.F.R. § 1.131 that establishes invention of the subject matter of the claims prior to the effective date of the cited document of Berstis (filed May 17, 2001).

Accordingly, Applicants submit that the cited document of Berstis is disqualified as prior art.

Response to 103 Rejection of claims 1, 2, 4, 7, 10, 11, 13, 14, 30, 33 and 34

The Office action rejects claims 1, 2, 4, 7, 10, 11, 13, 14, 30, 33 and 34 under 35 U.S.C. §103(a) as being unpatentable over Maheshwari (U.S. Patent No. 5,974,508) in view of Teoman et al. (U.S. Patent No. 6,463,509). Applicants believe this rejection has been overcome in view of the amendments made above and the remarks that follow.

Office action has not established a prima facie case of obviousness

It is respectfully submitted that there is no suggestion or motivation in the prior art to combine the cited documents of Maheshwari and Teoman et al. as

13

suggested by the Examiner. Therefore, the Office action has failed to establish a prima facie of obviousness.

It is well established that in order to establish a prima facie case of obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations (see e.g., M.P.E.P. §2142) . In addition, a prima facie showing of obviousness may only be established if there is a clear suggestion from or in the prior art to make the modifications proposed by the Examiner. See Gillette Co. v. S.C. Johnson & Son, Inc. 919 F. 2d 720 (Fed Cir. 1990). Further, Applicants respectfully point out that the suggestion or motivation to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in Applicants' disclosure. It is improper to rely on the teachings of Applicants' specification as a basis for combining the cited documents.

Applicants submit that the Office action has not established a prima facie case of obviousness using Maheshwari and Teoman et al. for the reasons stated in the Applicants' prior response filed on July 28, 2003. In response to Applicants' prior response, the Examiner appears to conclude that one skilled in the art would be motivated to modify Maheshwari by replacing the instruction and data caches (e.g., 150 and 151 of FIG. 1 of Maheshwari) with a non-volatile cache because the tradeoff of having a non-volatile cache is valuable enough "to be worth the small slow down being endured by the system due to the change in cache." Applicants respectfully disagree with this conclusion and submit that there is nothing in the cited documents to support this conclusion by the Examiner. For

14

example, there is nothing to suggest that the modification of Maheshwari as suggested by the Examiner would result in a "small slow down." In addition, none of references teaches or suggests using a non-volatile cache as an integrated cache within a CPU, wherein the non-volatile cache is used as integrated instruction and data caches.

The cited document of Maheshwari repeatedly states the importance of reducing memory access time in a CPU based system. See e.g., col. 1, lines 24-29; col. 1, lines 48-52; and col. 3, lines 30-51 of Maheshwari. And, no where in the document is there a suggestion of a desire to use a non-volatile cache at the expense of using a memory technology having a relatively slower access time. Typically, a volatile static random access memory (SRAM) is used as a cache memory . See e.g., John L. Hennessy et al., *Computer Architecture*, pg. 456 (3rd ed. 2003). Because SRAMs have a relatively fast access time compared to other memory technologies, SRAMs are typically used as an integrated cache memory in a CPU, e.g., as a level 1 (L1) cache, even though they are relatively expensive and volatile. Accordingly, Applicants assert that at the time of the invention, one skilled in the art would not be motivated to combine Maheshwari and Teoman et al. as suggested by the Office action.

In addition, Applicants point out that the Examiner did not address the Applicants argument in Applicants' prior response that the proposed modification of Maheshwari would change the principle of operation of Maheshwari.

Thus, it is respectfully submitted that there is no suggestion or motivation in the prior art to combine the cited documents of Maheshwari and Teoman et al. as

15

suggested by the Examiner. Therefore, the Office action has failed to establish a prima facie of obviousness.

As discussed above, in order to establish a prima facie case of obviousness, the prior art must teach or suggest all the claim limitations. Applicants' claim 1 recites, among other things, pinning at least a portion of the data stored in the non-volatile cache memory, wherein the pinning is performed during initialization of the system. At least this limitation of Applicants' claim 1 is not taught or suggested in the cited documents, either alone or in combination. Since the cited documents do not teach or suggest all the limitations of Applicants' claim 1, it is believed that the rejection of this claim should be withdrawn and that claim 1 is in condition for allowance.

Claims 2 and 4 depend from claim 1 and are believed to be allowable for the same reasons as claim 1.

Applicants' claim 7 recites a metadata stored in a system comprising a first state to indicate a least recently used information of a corresponding line of initialization data in a non-volatile memory of the system and a second state to indicate whether a corresponding line of initialization data in the non-volatile memory is pinned. This claimed combination of Applicants' claim 7 is not taught or suggested in the cited documents, either alone or in combination. Thus, it is believed that the rejection of this claim 7 should be withdrawn and that claim 7 is in condition for allowance.

Applicants' claim 10 recites, among other things, a second storage media to store metadata for the cache data stored in the first storage media, the

16

metadata including a state to indicate whether a corresponding line of data is pinned, wherein the state is set during initialization of the system. At least this feature of Applicants' claim 10 is not taught or suggested in the cited documents, either alone or in combination. Since the cited documents do not teach or suggest all the limitations of Applicants' claim 10, it is believed that the rejection of this claim should be withdrawn and that claim 10 is in condition for allowance.

Claims 11, 13, and 14 depend from claim 10 and are believed to be allowable for the same reasons as claim 10.

Applicants' claim 30 recites, among other things, a second group of computer instructions to pin data accessed in the non-volatile cache, during initialization of the system. At least this feature of Applicants' claim 30 is not taught or suggested in the cited documents, either alone or in combination. Since the cited documents do not teach or suggest all the limitations of Applicants' claim 30, it is believed that the rejection of this claim should be withdrawn and that claim 30 is in condition for allowance.

Applicants' claim 33 recites, among other things, marking data stored in a non-volatile cache memory to prevent eviction of the data, wherein the marking occurs during initialization of the system. At least this feature of Applicants' claim 33 is not taught or suggested in the cited documents, either alone or in combination. Since the cited documents do not teach or suggest all the limitations of Applicants' claim 33, it is believed that the rejection of this claim should be withdrawn and that claim 33 is in condition for allowance.

Claim 34 depends from claim 33 and is believed to be allowable for the same reasons as claim 33.

Response to 35 U.S.C. §103 Rejection of claims 3, 8, 31, 32, and 35

The Office action rejects claims 3, 8, 31, 32 and 35 under 35 U.S.C. §103(a) as being unpatentable over Maheshwari (U.S. Patent No. 5,974,508) in view of Teoman et al. (U.S. Patent No. 6,463,509) as applied to claims 1, 7, 30 and 33 above, and further in view of Berstis (U.S. Patent Publication No. 2002/0174370). Applicants believe this rejection has been overcome in view of the amendments made above and the remarks that follow.

As discussed above, Applicants submit that the cited document of Berstis is disqualified as prior art.

Further, claim 3 depends from claim 1 and is believed to be allowable for the same reasons as claim 1. Claim 8 depends from claim 7 and is believed to be allowable for the same reasons as claim 7. Claims 31 and 32 depend either directly or indirectly from claim 30 and are believed to be allowable for the same reasons as claim 30. Claim 35 depends from claim 33 and is believed to be allowable for the same reasons as claim 33.

Response to 35 U.S.C. §103 Rejection of claims 5, 6, 9 12, and 36

The Office action rejects claims 5, 6, 9, 12 and 36 under 35 U.S.C. §103(a) as being unpatentable over Maheshwari (U.S. Patent No. 5,974,508) in view of Teoman et al. (U.S. Patent No. 6,463,509) as applied to claims 1, 4, 7, and 35

18

above, and further in view of Shirata et al. (U.S. Patent Publication No. 2001/0043784). Applicants believe this rejection has been overcome in view of the amendments made above and the remarks that follow.

Claims 5 and 6 depend indirectly from claim 1 and are believed to be allowable for the same reasons as claim 1. Claim 9 depends from claim 7 and is believed to be allowable for the same reasons as claim 7. Claim 12 depends from claim 10 and is believed to be allowable for the same reasons as claim 10. Claim 36 depends from claim 33 and is believed to be allowable for the same reasons as claim 33.

Response to 35 U.S.C. §103 Rejection of claims 15-29

The Office action rejects claims 15-29 under 35 U.S.C. §103(a) as being unpatentable over Maheshwari (U.S. Patent No. 5,974,508) in view of Teoman et al. (U.S. Patent No. 6,463,509) and further in view of Berstis (U.S. Patent Publication No. 2002/0174370). Applicants believe this rejection has been overcome in view of the amendments made above and the remarks that follow.

As discussed above, Applicants submit that the cited document of Berstis is disqualified as prior art. Further, as discussed above, Applicants submit that the Office action has not established a prima facie case of obviousness using Maheshwari and Teoman et al. Thus, the rejection of claims 15 and 23 should be withdrawn and it is believed that claims 15 and 23 are in condition for allowance.

Applicants' claim 15 recites, among other things, pinning data accessed during the system initialization in the first memory, wherein the pinning occurs during the system initialization. At least this feature of Applicants' claim 15 is not taught or suggested in the cited documents, either alone or in combination. Since the cited documents do not teach or suggest all the limitations of Applicants' claim 15, it is believed that the rejection of this claim should be withdrawn and that claim 15 is in condition for allowance.

Claims 16-22 depend either directly or indirectly from claim 15 and are believed to be allowable for the same reasons as claim 15.

Applicants' claim 23 recites, among other things, a memory control hub to cause the first state to be set for data accessed during the system initialization, the setting of the first state to occur during the system initialization and to indicate that a corresponding line of data is pinned. At least this element of Applicants' claim 23 is not taught or suggested in the cited documents, either alone or in combination. Since the cited documents do not teach or suggest all the limitations of Applicants' claim 23, it is believed that the rejection of this claim should be withdrawn and that claim 23 is in condition for allowance.

Claims 24-29 depend from claim 23 and are believed to be allowable for the same reasons as claim 23.

PATENT APPLICATION
042390.P11448

New Claims

As indicated above, claims 37-41 have been added and are believed to be allowable. Applicants submit that no new matter has been added.

Claims 37-41 depend either directly or indirectly from claim 33 and are believed to be allowable for the same reasons as claim 33.

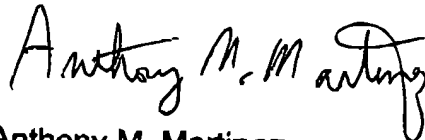PATENT APPLICATION
042390.P11448

Conclusion

In view of all of the above, it is believed that Applicants' claims are allowable, and the case is in condition for allowance, which action is earnestly solicited. Reconsideration of the rejections and objections is respectfully requested.

Should it be determined that an additional fee is due under 37 CFR §§1.16 or 1.17, or any excess fee has been received, please charge that fee or credit the amount of overcharge to deposit account #02-2666.

If the Examiner believes that there are any informalities that can be corrected by an Examiner's amendment, a telephone call to the undersigned at (480) 552-0624 is respectfully solicited.

Respectfully submitted,
Richard L. Coulson et al.

Anthony M. Martinez
Patent Attorney
Reg. No. 44,223

Dated: March 24, 2004

c/o Blakely, Sokoloff, Taylor & Zafman, LLP
12400 Wilshire Blvd., Seventh Floor
Los Angeles, CA 90025-1026
(503) 264-0967

22